

What is claimed is:

1. A fixing device for applying at least heat and a pressure to a recording material on which toner is carried in a shape of an image pattern to form an unfixed toner image to fix the unfixed toner image on the recording material to thereby obtain a toner image, the fixing device comprising:

a heating and temporarily fixing unit that applies at least heat to the unfixed toner image formed on the recording material to soften or melt the toner of the unfixed toner image into a state of being able to be deformed by an external force; and

an image gloss control unit that, while the toner is maintained in the state of being able to be deformed by the external force by the heating and temporarily fixing unit, presses the toner in a nonheating manner to flow the toner.

2. A fixing device according to claim 1, wherein the image gloss control unit is composed of at least one pair of rotating bodies adapted to be rotated while being in press-contact with each other to form a pressing nip portion, and serves to insert the recording material in which the toner of the unfixed toner image is maintained in the state of being able to be deformed by an external force into the pressing nip portion to thereby press and flow the toner.

3. A fixing device according to claim 2, wherein the image gloss control unit includes a cooling unit that maintains surface temperatures of the at least one pair of rotating bodies at a predetermined temperature or lower.

4. A fixing device according to claim 2, wherein at least one of the at least one pair of rotating bodies is constituted of at least a base layer and a releasing layer.

5. A fixing device according to claim 4, wherein an elastic body layer is further formed between the base layer and the releasing layer.

6. A fixing device according to claim 5, further comprising a surface hardness control layer provided between the elastic body and the releasing layer.

7. A fixing device according to claim 6, wherein an elastic modulus of a material that forms the surface hardness control layer is higher than an elastic modulus of each of materials that forms the elastic layer and the releasing layer, respectively.

8. A fixing device according to claim 2, wherein the press-contact of the at least one pair of rotating bodies is made

releasable.

9. A fixing device according to claim 2, wherein a press-contact force of the at least one pair of rotating bodies is made variable.

10. A fixing device according to claim 1, wherein a surface temperature of the toner after executing a treatment therefor by the image gloss control unit is adjusted so as to become lower than a temperature at which the toner becomes the state of being able to be deformed by the external force.

11. A fixing device according to claim 1, wherein the heating and temporarily fixing unit is a unit including a heating rotating body and a pressing rotating body adapted to be rotated while being in press-contact with each other to form a fixing nip portion, and is for inserting the recording material on which the unfixed toner image formed into the fixing nip portion to soften or melt the toner of the unfixed toner image into the state of being able to be deformed by the external force.

12. A fixing device according to claim 9, wherein a pressure applied to the recording material in the image gloss control unit is higher than that in the heating and temporarily fixing unit.

13. A fixing device according to claim 1, further comprising a fixing condition control mechanism for controlling at least one of a heating time and a heating temperature in the heating and temporarily fixing unit in accordance with a kind of the recording material to be used.

14. A fixing device according to claim 1, wherein a heat insulating structure against the outside air is adopted between the heating and temporarily fixing unit and the image gloss control unit.

15. A fixing device according to claim 1, further comprising a heat holding device that holds heat between the heating and temporarily fixing unit and the image gloss control unit.

16. A fixing method of applying at least heat and a pressure to a recording material on which toner is carried in a shape of an image pattern to form an unfixed toner image to fix the unfixed toner image on the recording material to thereby obtain a toner image, the fixing method comprising:

a heating and temporarily fixing process for applying at least heat to the unfixed toner image formed on the recording material to soften or melt the toner of the unfixed toner image into a state of being able to be deformed by an external force; and

an image gloss control process for, while the toner is maintained in the state of being able to be deformed by an external force through the heating and temporarily fixing process, pressing the toner in a nonheating manner to flow the toner.

17. A fixing method according to claim 16, wherein the image gloss control process is a process for inserting the recording material on which the unfixed toner image is formed with the toner maintained in a state of being able to be deformed by the external force into a pressing nip portion to press and flow the toner, the nip portion being formed by of at least one pair of rotating bodies adapted to be rotated while being in press-contact with each other.

18. A fixing method according to claim 17, wherein in the image gloss control process, surface temperatures of the at least one pair of rotating bodies are maintained to be a predetermined temperature or lower.

19. A fixing method according to claim 17, wherein a press-contact force of the at least one pair of rotating bodies is made variable in accordance with a degree of desired image glossiness.

20. A fixing method according to claim 16, wherein a surface

temperature of the toner after executing the processing therefor in the image gloss control process is adjusted to become lower than the temperature at which the toner can be deformed by an external force.

21. A fixing method according to claim 16, wherein the heating and temporarily fixing process is a process for inserting the recording material on which the unfixed toner image is formed into a fixing nip portion to soften or melt the toner of the unfixed toner image into the state of being able to be deformed by the external force, the fixing nip portion being formed by a heating rotating body and a pressing rotating body adapted to be rotated while being in press-contact with each other.

22. A fixing method according to claim 21, wherein a pressure applied to the recording material in the image gloss control process is larger than that in the heating and temporarily fixing process.

23. A fixing method according to claim 16, wherein at least one of a heating time and a heating temperature in the heating and temporarily fixing process is controlled in accordance with a kind of applied recording material.

24. A fixing method according to claim 16, wherein for processes

from the heating and temporarily fixing process to the image gloss control process, the heat of the recording material on which the unfixed toner image is formed with the toner in a softening or melting state is held.

25. An image forming apparatus comprising at least: an unfixed toner image forming unit that makes a surface of a recording material carry toner in a shape of an image pattern to form an unfixed toner image; and a fixing unit that heats and presses the unfixed toner image carried on the surface of the recording material to fix the toner image,

wherein the fixing unit is comprised of the fixing device as claimed in claim 1.

26. An image forming apparatus according to claim 25, wherein the unfixed toner image forming unit is a unit that forms an unfixed toner image in accordance with an electrophotographic system.